



specifying guide

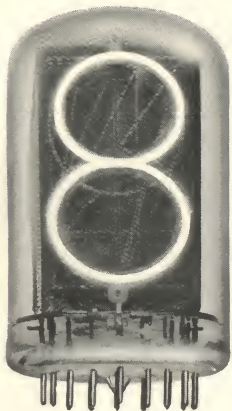


ELECTRONIC COMPONENTS AND SYSTEMS

NIXIE® indicator tube line



JUMBO



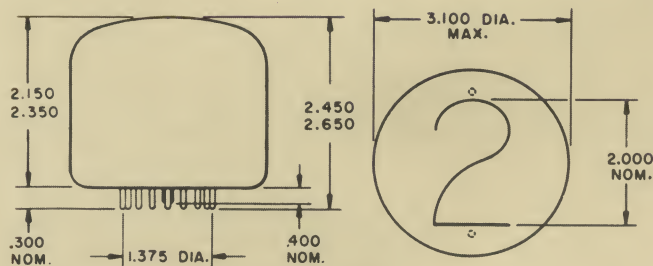
JUMBO SIDE VIEWING

Character Size 2"
Viewing Distance . . . 100'

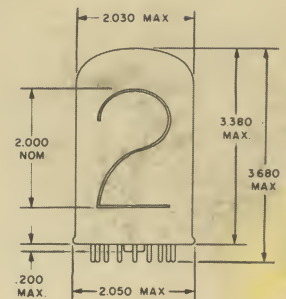


LARGE

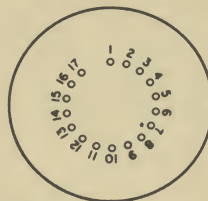
Character Size 1.4"
Viewing Distance 65'



OUTLINE DRAWING



OUTLINE DRAWING



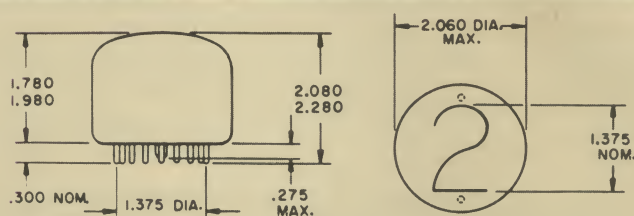
PIN CONNECTIONS

PIN NO.	CHARACTER	CHARACTER
1	Internal Connection	Internal Connection
2	Anode	Anode
3	Numeral 0	Numeral 6
4	Numeral 9	Numeral 0
5	Internal Connection	Internal Connection
6	Internal Connection	Internal Connection
7	Numeral 8	Numeral 2
8	Numeral 7	Numeral 4
9	Numeral 6	Numeral 1
10	Internal Connection	Internal Connection
11	Internal Connection	Internal Connection
12	Numeral 5	Numeral 8
13	Numeral 4	Numeral 9
14	Numeral 3	Numeral 5
15	Internal Connection	Internal Connection
16	Numeral 2	Numeral 7
17	Numeral 1	Numeral 3

ELECTRICAL DATA

JUMBO

	B7094 Long Life Wide Angle	B7037 Side View Long Life Wide Angle
Absolute Ratings		
Ionization Voltage (Max)	300 Vdc	250 Vdc
Supply Voltage (Min)	300 Vdc	250 Vdc
Cathode Current (Peak)	7.5 ma	10.0 ma
Test Conditions		
Supply Voltage	300 Vdc	250 Vdc
Series Resistor	27K	18K
Cathode Current: (Min)	4.0 ma	4.0 ma
(Max)	7.0 ma	7.0 ma



OUTLINE DRAWING

ELECTRICAL DATA

LARGE

	B8091 Long Life Wide Angle
Absolute Ratings	
Ionization Voltage (Max)	170 Vdc
Supply Voltage (Min)	170 Vdc
Cathode Current (Peak)	6.5 ma
Test Conditions	
Supply Voltage	170 Vdc
Series Resistor	5.6K
Cathode Current: (Min)	3.0 ma
(Max)	6.0 ma

PIN CONNECTIONS

PIN NO.	CHARACTER	CHARACTER
1	Internal Connection	Internal Connection
2	Anode	Anode
3	Numeral 0	Numeral 6
4	Numeral 9	Numeral 0
5	Internal Connection	Internal Connection
6	Internal Connection	Internal Connection
7	Numeral 8	Numeral 2
8	Numeral 7	Numeral 4
9	Numeral 6	Numeral 1
10	Internal Connection	Internal Connection
11	Internal Connection	Internal Connection
12	Numeral 5	Numeral 8
13	Numeral 4	Numeral 9
14	Numeral 3	Numeral 5
15	Internal Connection	Internal Connection
16	Numeral 2	Numeral 7
17	Numeral 1	Numeral 3



Year after year, NIXIE Indicator Tubes remain industry's most popular readout. More manufacturers choose NIXIE Tubes over all other readouts for their equipment designs because they have most reliable (MTBF of one million hours @ 90% confidence with useful life of more than 200,000 hours) • constant brightness • best readability from every angle • lowest cost • smallest size • most rugged construction • availability of JAN types.

The Rectangular NIXIE Tube offers dramatic dimensional reduction, but the same character size is maintained. There's a NIXIE Tube for every readout application. From jumbo to standard to miniature size, from special character to numerical display, the outstanding performance remains the same.

Request Brochure 616.



SUPER

Character Size0.8"
Viewing Distance38'



STANDARD



STANDARD RECTANGULAR

Character Size0.6"
Viewing Distance30'

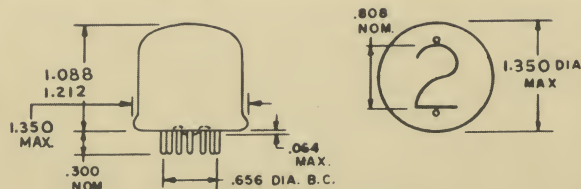


STANDARD MINIATURE



MINIATURE RECTANGULAR

Character Size0.3"
Viewing Distance14'



OUTLINE DRAWING

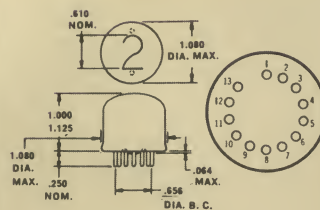
PIN NO.	CHARACTER
1	Internal Connection
2	Anode
3	Numeral 0
4	Numeral 9
5	Numeral 8
6	Numeral 7
7	Numeral 6
8	Internal Connection
9	Numeral 5
10	Numeral 4
11	Numeral 3
12	Numeral 2
13	Numeral 1



ELECTRICAL DATA

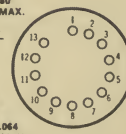
SUPER

	7153 Regular	8423 (B6091) Long Life Wide Angle
Absolute Ratings		
Ionization Voltage (Max)	250 Vdc	170 Vdc
Supply Voltage (Min)	250 Vdc	170 Vdc
Cathode Current (Peak)	5.0 ma	4.5 ma
Test Conditions		
Supply Voltage	250 Vdc	170 Vdc
Series Resistor	43K	6.8K
Cathode Current: (Min) (Max)	2.0 ma 3.0 ma	1.5 ma 4.0 ma

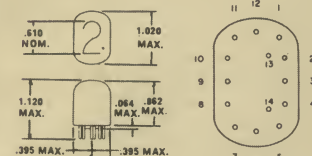


OUTLINE DRAWINGS

PIN NO.	CHARACTER
1	Internal Connection
2	Anode
3	Numeral 0
4	Numeral 9
5	Numeral 8
6	Numeral 7
7	Numeral 6
8	Internal Connection
9	Numeral 5
10	Numeral 4
11	Numeral 3
12	Numeral 2
13	Numeral 1



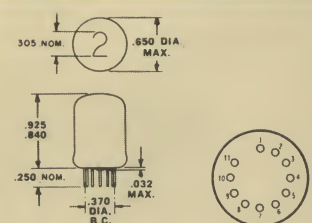
PIN NO.	CHARACTER
1	Anode
2	Numeral 0
3	Numeral 9
4	Numeral 8
5	Numeral 7
6	Numeral 6
7	Numeral 5
8	Numeral 4
9	Numeral 3
10	Numeral 2
11	Numeral 1
12	Internal Connection
13	Internal Connection
14	Internal Connection



ELECTRICAL DATA

STANDARD

	8422 (B5991) Long Life Rectan- gular	6844A Regular	8037 (B5031) Long Life	8421 (B5092) Long Life Wide Angle
Absolute Ratings				
Ionization Voltage (Max)	170 Vdc	170 Vdc	170 Vdc	170 Vdc
Supply Voltage (Min)	170 Vdc	170 Vdc	170 Vdc	170 Vdc
Cathode Current (Peak)	3.5 ma	4.0 ma	3.5 ma	3.5 ma
Test Conditions				
Supply Voltage	170 Vdc	170 Vdc	170 Vdc	170 Vdc
Series Resistor	8.2K	15K	10K	10K
Cathode Current: (Min) (Max)	1.5 ma 3.0 ma	1.5 ma 3.0 ma	1.5 ma 3.0 ma	1.5 ma 3.0 ma

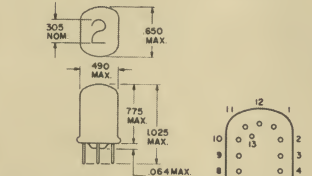


OUTLINE DRAWINGS

PIN NO.	CHARACTER
1	Numeral 1
2	Numeral 2
3	Numeral 3
4	Numeral 4
5	Numeral 5
6	Numeral 6
7	Numeral 7
8	Numeral 8
9	Numeral 9
10	Numeral 0
11	Anode



PIN NO.	CHARACTER
1	Numeral 2
2	Numeral 3
3	Numeral 4
4	Numeral 5
5	Numeral 6
6	Internal Connection
7	Numeral 7
8	Numeral 8
9	Numeral 9
10	Numeral 0
11	Anode
12	Numeral 1
13	Internal Connection

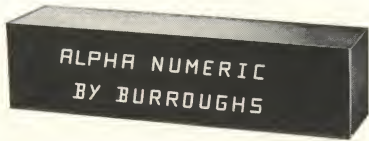


ELECTRICAL DATA

MINIATURE

	B4991 B4998 Long Life Rectan- gular	B4081 Wide Viewing Angle	7977 (B4032) Long Life	7009 Regular	8502 (B4021) Low Voltage
Absolute Ratings					
Ionization Voltage (Max)	170 Vdc	170 Vdc	170 Vdc	170 Vdc	120 Vdc
Supply Voltage (Min)	170 Vdc	170 Vdc	170 Vdc	170 Vdc	120 Vdc
Cathode Current (Peak)	2.5 ma	2.0 ma	2.0 ma	2.0 ma	2.0 ma
Test Conditions					
Supply Voltage	170 Vdc	170 Vdc	170 Vdc	170 Vdc	120 Vdc
Series Resistor	15K	68K	15K	68K	20K
Cathode Current: (Min) (Max)	1.0 ma 2.0 ma	0.7 ma 1.4 ma	0.7 ma 1.4 ma	0.7 ma 1.2 ma	0.7 ma 1.4 ma

The B4998 has short leads and mates with miniature rectangular socket. The B4991 incorporates flying leads for direct solder to printed circuit boards.
B4991 outline is not shown.



ALPHA-NUMERIC DISPLAY SYSTEMS

ALPHA
NUMERIC



Large



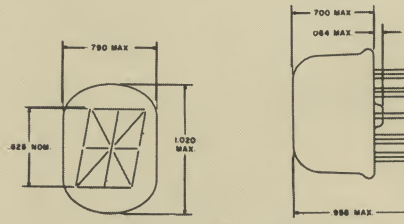
Medium

ALPHA NUMERIC NIXIE TUBES

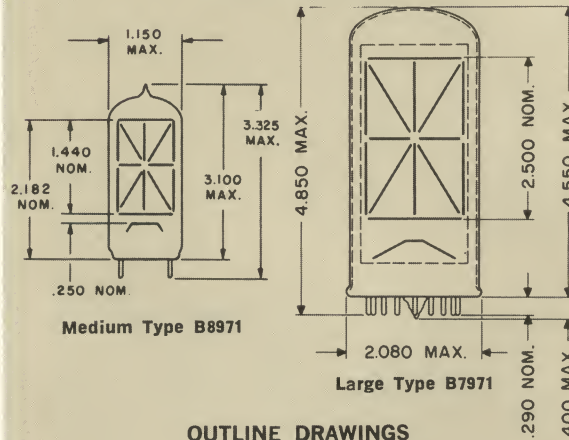


BIQUINARY NIXIE
INDICATOR TUBE

Alpha Numeric Display Systems by Burroughs, designed around new Alpha Numeric NIXIE Tubes, give you everything from the input . . . out. These systems are adaptable to any kind of electronic information display requirements. System flexibility is enhanced by the use of standard highly reliable semiconductor modules. The modular concept facilitates custom design of display systems to meet individual functional and physical specifications.



Standard Type B5971



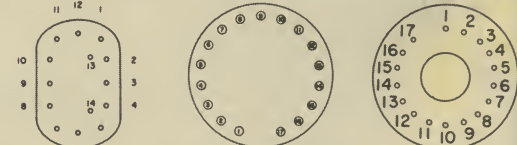
OUTLINE DRAWINGS

The Alpha Numeric NIXIE Tube represents a new dimension in indicator tube design. It combines all the best characteristics of numeric NIXIE Tubes in an in-plane display capable of displaying all the letters of the alphabet, numerals 0-9, and special symbols. The new tube features exceptionally bright continuous line characters and compatibility with solid state drive circuitry. Other features include all DC operation • memory • long life with no fading.

Request Brochure 616



SEGMENT DESIGNATIONS



BASING DIAGRAMS

B5971		B8971		B7971	
PIN NO.	ELEMENT	PIN NO.	ELEMENT	PIN NO.	ELEMENT
1 —	Anode	1 —	Anode	1 —	K8
2 —	K6	2 —	9	2 —	K15
3 —	K13	3 —	2	3 —	K11
4 —	K5	4 —	3	4 —	K9
5 —	K12	5 —	10	5 —	K2
6 —	K4	6 —	1	6 —	K3
7 —	K11	7 —	4	7 —	K10
8 —	K3	8 —	15	8 —	K1
9 —	K10	9 —	8	9 —	K4
10 —	K2	10 —	7	10 —	K12
11 —	K9	11 —	5	11 —	Int. Con
12 —	K1	12 —	6	12 —	K14
13 —	K7	13 —	14	13 —	Anode
14 —	K8	14 —	13	14 —	K5
		15 —	12	15 —	K6
		16 —	11	16 —	K7
		17 —	NC	17 —	K13

PIN CONNECTIONS

ELECTRICAL CHARACTERISTICS

B5971	
Absolute Ratings	
Supply Voltage (Ebb)	170 Vdc Min.
Cathode Current	
I _k (Total all cathodes)	12 ma max.
I _k (Individual cathodes, K1 through K12—except K8, K10)	4 ma max.
I _k (Individual cathodes, K10, K13)	3 ma max.
I _k (Individual cathode, K8)	6 ma max.
Test Conditions	
Supply Voltage (Ebb)	170 Vdc
Series Anode Resistor (R _F)	6.8 K ±1%

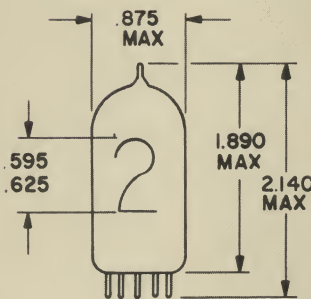
B8971	B7971
Absolute Ratings	
Supply Voltage (Ebb, Vdc min)	170
Individual Cathode Current (I _k , ma max)	
K1, K4, K15	6.0
K7, K9, K11, K13	5.0
K10, K14	3.5
K2, K3, K5, K6, K8, K12	4.5
Total All Cathodes	14.0
Test Conditions	
Supply Voltage (Ebb, Vdc)	170
Series Anode Resistor (R _F , Ohms)	4.3 K ±1% 1.8 K ±1%

TYPICAL OPERATING CONDITIONS; TYPE B5030

"On" Anode Supply Voltage	Ebb	180	220	250	300
"Off" Anode Supply Voltage	Ebb	100	100	100	100
Tube Voltage Drop	E _{td}	100	100	100	100
Anode Series Limiting Resistor	R _p	10	20	27	39
Cathode Pre-bias Voltage	E _{kk}	50	50	50	50
Screen Series Limiting Resistor	R _s	180	180	180	180
Screen Supply Voltage	E _{ss}	0	0	0	0
"On" Anode Current	I _a	4.0	4.0	4.0	4.0
"On" Cathode Current	I _k	3.3	3.3	3.3	3.3

PIN CONNECTIONS

PIN NO.	ELEMENT
1	Int. Con.
2	Rear Anode Even
3	K (8-9)
4	K (6-7)
5	K (4-5)
6	Screen
7	K (2-3)
8	K (0-1)
9	Front Anode Odd



OUTLINE DRAWING



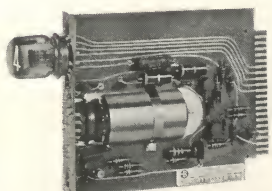
Request Brochure 616



PIXIE® POSITION
INDICATOR TUBES



BEAM-X® SWITCHES



BEAM-X MODULES



NIXIE TUBE ASSEMBLIES

The B-9012 is a gas-filled, cold cathode, indicator tube. It contains ten glow positions or cathodes located 36° apart which are visible through numerical perforations in a plate located above the cathodes. The plate serves as a common anode and functions in the manner of an internal bezel with the indicated number determined by the position of the glow discharge. A twelfth electrode functions as a "keep alive" to obtain rapid ionization for those applications in which this property is desirable. Drivers (Type BIP-8506) are available to drive the PIXIE tube from low level input signals compatible with standard transistor circuitry.

Request Brochure 616

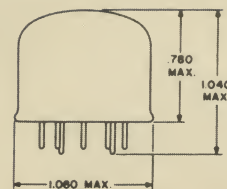
ELECTRICAL DATA

Absolute Ratings

Individual Cathode Ionization Voltage .. 150 Vdc max.
Individual Cathode Current 600 μ a max.
Keep Alive Ionization Voltage 180 Vdc max.

Test Conditions

Anode to Cathode Supply Voltage 150 Vdc
Anode Series Resistor 82 K $\pm$ 1%
Anode to Keep Alive Supply Voltage 180 Vdc
Cathode Current 400 μ a max.
250 μ a min.



OUTLINE DRAWING



PIN NO.	CHARACTER
1	2
2	1
3	0
4	9
5	8
6	7
7	6
8	5
9	4
10	3
11	ANODE
12	KEEP ALIVE
13	ANODE

Beam-X Switches, which are 10 output high vacuum electronic tubes, provide a highly reliable, low cost switching technique with 1.0 megacycle switching capability.

Beam-X modules with integral NIXIE Tube readout are available for counting, BCD conversion, or as readout memory drivers. They facilitate circuit design and drive NIXIE Tubes directly, eliminating decoding matrices and amplifiers.

Tube types are:

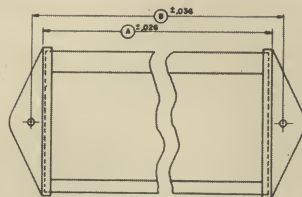
- BX-1000—general purpose
- BX-2000—general purpose shielded
- BX-2012—decimal readout from binary data
- BX-3000—high current capability
- BX-4001—low cost, low voltage counting & gating

Request Bulletins 1065, 1016 and Brochure 535

Beam-X Modules are:

- DC-100—110 KC decade counter, remote readout
- DC-112—110 KC counter, distributor, scanner
- DC-113—1 KC low cost decade counter
- DC-118—110 KC decade counter, integral readout

Request Brochure 405



OUTLINE DRAWING

Now there's a new way to buy NIXIE Tubes. NIXIE Tube assemblies provide an attractive, professional appearance, and save you electrical and mechanical design time as well as the cost of tooling. NIXIE Tube assemblies consist of any number or arrangement of NIXIE Tubes mounted in a bezel. Driver modules such as the SCS counters and decoders and socket packs shown on pages 6 and 7 can be mounted on bezels to provide readout operation from a wide variety of input signals.

Request Bulletin 1020

OVER-ALL LENGTHS FOR STANDARD BEZEL ASSEMBLIES

TUBE QUAN.	STANDARD BEZEL ASSEMBLIES							
	MINIATURE BEZ-40		STANDARD BEZ-50		RECTANGULAR BEZ-59		SUPER BEZ-60	
	A	B	A	B	A	B	A	B
2	3.125	3.425	4.125	4.425	3.325	3.625	4.125	4.425
3	3.875	4.175	5.312	5.612	4.125	4.425	5.625	5.925
4	4.625	4.925	6.500	6.800	4.925	5.225	7.125	7.425
5	5.375	5.675	7.687	7.987	5.725	6.025	8.625	8.925
6	6.125	6.425	8.875	9.175	6.525	6.825	10.125	10.425
7	6.875	7.175	10.062	10.362	7.325	7.625	11.625	11.925
8	7.625	7.925	11.250	11.550	8.125	8.425	13.125	13.425
9	8.375	8.675	12.437	12.737	8.925	9.225	14.625	14.925
10	9.125	9.425	13.625	13.925	9.725	10.025	16.125	16.425
11	9.874	10.174	14.806	15.106	10.524	10.824	17.624	17.924
12	10.624	10.924	15.993	16.293	11.324	11.624	19.124	19.424
13	11.374	11.674	17.180	17.480	12.124	12.424	20.624	20.924
14	12.124	12.424	18.367	18.667	12.924	13.224	22.124	22.424
15	12.874	13.174	19.554	19.854	13.724	14.024	23.624	23.924

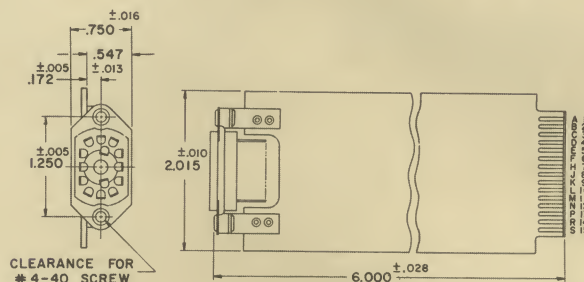


The BIP-8054 counts at rates in excess of 110 KC, while the BIP-8055 has counting capability of 150 KC. Support modules are available such as preset/reset, Type BIP-8609, preamplifier, Type BIP-8606 and polarity detector, Type BIP-8006.

Request Bulletins 1062,1063 and 1069

ELECTRICAL CHARACTERISTICS

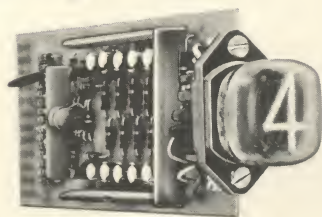
BIP-8054		BIP-8055
INPUT REQUIREMENTS		
Operating Frequency	DC to 110 KC	DC to 150 KC
Pulse Amplitude	12V $\pm$ 1V	6V to 12V
Pulse Rise Time	0.1 μ sec. max.	0.5 μ sec. max.
Pulse Duration	1.6 μ sec. $\pm$ 5%	2.0 μ sec. min.
RESET REQUIREMENTS		
Amplitude (Positive)	12V $\pm$ 1V	12V $\pm$ 1V
Rise Time	0.1 μ sec. max.	0.5 μ sec. max.
Pulse Duration	2 μ sec. min.	5.0 μ sec. min.
OUTPUTS		
Visual Decimal Readout	NIXIETube Type 8422 (B5991)	NIXIETube Type 8422 (B5991)
Carry Output		
Amplitude	+12V $\pm$ 1V	-7V Typical
Rise Time	0.1 μ sec. max.	0.6 μ sec. Typical
Carry Delay	0.1 μ sec. max.	1.0 μ sec. max.
Electrical Decimal Outputs	(5, E, F, H, 6, J, K, L, M, R)	(H, J, K, L, 9, M, 12, P, 15, S)
Counting Mode—	22K ohms to ground	10K ohms to ground
Full Load		
POWER REQUIREMENTS		
	+200V $\pm$ 10V @ 4 ma max.	+200V $\pm$ 20V @ 4 ma max.
	+12V $\pm$ 1V @ 15 ma max.	+12V $\pm$ 1V @ 40 ma max.
	-12V $\pm$ 1V @ 2 ma max.	-12V $\pm$ 1V @ 1 ma max.



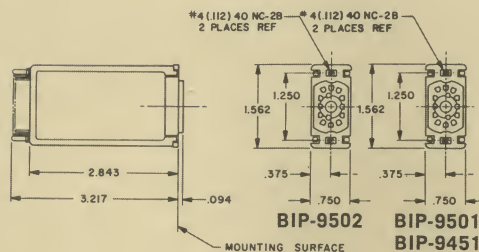
OUTLINE DRAWING

A new line of memory driver modules and decoder memory drivers is now available from Burroughs, designed around hybrid microcircuits which utilize the unique glassvated single-sided silicon controlled switch as the main memory element. The line features low cost, high density packaging, combining standard printed circuit techniques with low cost wrap around sheet metal enclosures. The BIP-9501 and BIP-9502 are low voltage input modules; the former drives the standard rectangular NIXIE Tube, type 8422, and the BIP-9502 drives the standard Alpha Numeric Tube B-5971. The BIP-9451 is a self-decoding readout driver for standard rectangular NIXIE Tubes. Operating from positive logic levels, it provides decimal readout from 8-wire 8-4-2-1 BCD input. Latching and storage features permit sampling and holding of input data. Printed circuit type module, the BIP-8404, is a decoder driver with memory, available for operation from negative logic levels.

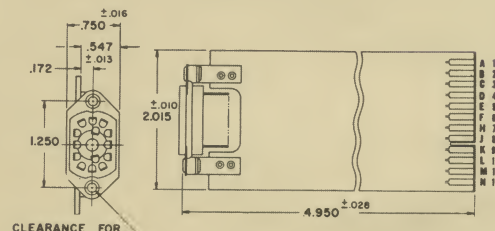
Request Bulletins 1071 and 1060



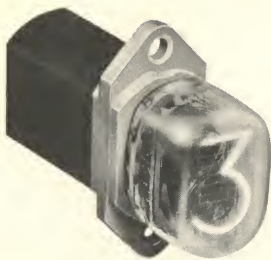
DECODER/DRIVER MODULES



OUTLINE DRAWING



OUTLINE DRAWING BIP-8404



SOCKET PACK READOUT
DRIVERS/DECODERS

The Type BIP-8211P is a self-decoding readout driver designed to operate NIXIE tubes from low voltage 8-4-2-1 BCD information (other modules are available to decode such codes as 5-4-2-1, 2-4-2-1, 4-2-2-1).

The Type BIP-8501 accepts low level decimal inputs and develops switching voltages to drive standard size NIXIE tubes. All modules contain Burroughs highly-reliable multi-element semiconductor "Flat-Packs" which either decode or develop switching voltages as the case may be.

Request Bulletins 1054, 1038 and 1066

ELECTRICAL DATA

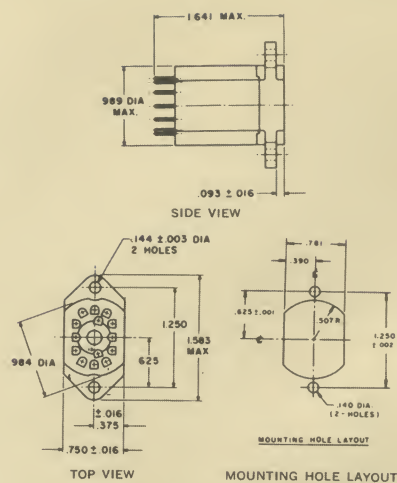
Signal Input—All modules accept a wide range of logic levels.

BIP-8211—8-4-2-1 BCD

Voltage difference required between logic levels is 2V to 35V.

BIP-8501—Decimal

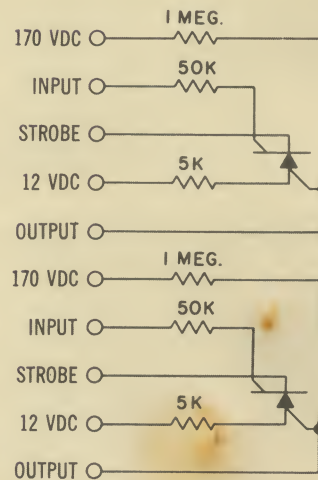
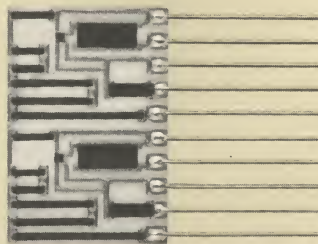
Voltage difference required between logic levels is 3V min.



OUTLINE DRAWING

Burroughs new single-sided, glassivated semiconductors represent a revolutionary advance in component packaging. This line of devices—silicon controlled switches, dual diodes and transistors—effects drastic cost reduction in the design and fabrication of hybrid circuits, making thick films the practical approach to low-cost microcircuit applications. The semiconductors are available as discrete components, or in hybrid circuits to your specifications. Typical hybrid circuit shown is a dual latch circuit to be used as a memory driver for NIXIE Indicator Tubes.

Request Brochure 1070



SCHEMATIC-DUAL LATCH BIP-6002
(2 latches per substrate)



SEMICONDUCTORS AND
HYBRID CIRCUITS

Burroughs complete line of ferrite cores. 20, 30, 50 & 80 mil, are manufactured and tested with infinite care to meet stringent military and industrial specifications. Cores in any given lot have 100% uniformity, guaranteeing reliability in assembled planes and stacks.

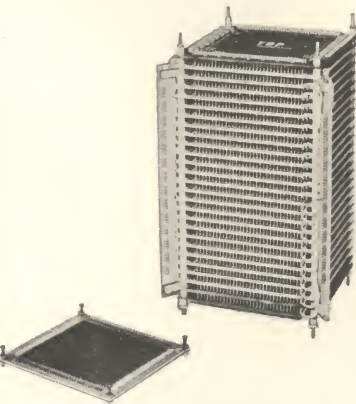
These memory products have been proven over and over again in Burroughs equipment and systems.

Whatever your memory requirements, individual cores, assembled planes or stacks, Burroughs is a logical source.

Charts shown are typical of a sampling of cores manufactured to specification.

Request Bulletins 1072 to 1078

CORE TYPE	FC-2001	FC-3003	FC-3004	FC-5002	FC-5003	FC-5004	FC-8001
Size—OD/ID	22/14	30/20	30/20	50/30	50/30	50/30	80/50
Nominal Drive Currents @ 25°C—ma	700/350	700/350	580/290	520/260	550/275	420/210	800/400
Rise Time—μ-sec.	0.10	0.10	0.10	0.15	0.2	0.5	0.2
μV1-μV	40	50	60	120	80	90	130
dVz-mv	2.5	4	6	13	7	5	20
tp-μ-sec.	0.20	0.22	0.22	0.34	0.41	0.68	0.55
ts-μ-sec.	0.35	0.40	0.38	0.68	0.80	1.18	1.0



MEMORY PRODUCTS
CORES—PLANES—STACKS

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